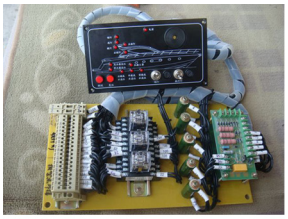
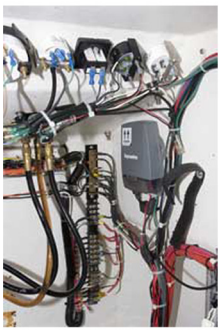
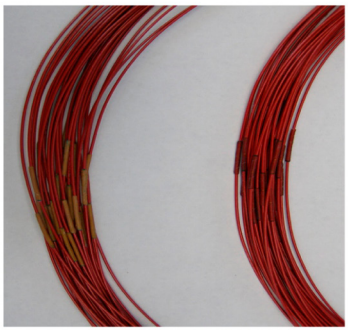
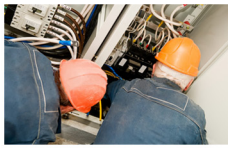
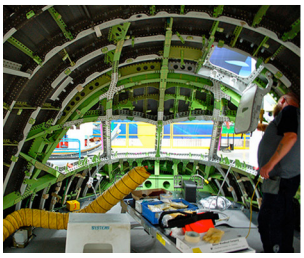
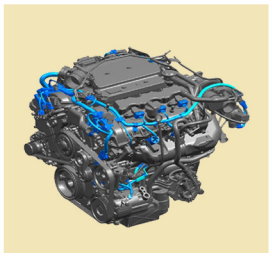
John F. Kennedy Space Center's Permanent Repair System for Polyimide Wire Insulation




The National Aeronautics and Space Administration (NASA) seeks partners interested in the commercial application of the Polyimide Wire Insulation Repair System technology. NASA's Kennedy Space Center is offering companies licensing for this innovative wire repair technology.

The Polyimide Wire Insulation Repair System is a kit consisting of thin film polyimide "patches," which are applied to damaged areas of wire insulation that have been damaged, along with a heating device that adheres the polyimide repair film into place. The technology has been prototyped and successfully tested by NASA and the Naval Air Systems Command (NAVAIR). Wire repairs made with this system are permanent, flexible, and much less intrusive than repairs made using current techniques

BENEFITS

- High performance – Repairs comply with industry standards for tensile strength, electrical resistivity, voltage break-down, solvent resistance, and flammability
- Flexibility – Repairs are more flexible and less bulky than repairs using existing techniques
- Airtightness – Technology provides a hermetic repair
- Durability – Repairs are permanent
- Adhesion – Unique adhesive properties provide superior bonding to damaged surface
- Adaptability – Materi-als and techniques can be used on larger-gauge wiring and flat-ribbon wire harnesses

opportunity

APPLICATIONS

- Aerospace Wiring
- Marine Wiring
- Automotive Wiring
- Industrial Wiring

TECHNOLOGY STATUS

- ☑ Patent pending
- ☐ U.S. patent
- ☐ Copyrighted
- ☑ Available to license
- ☐ Available for no-cost transfer
- ☐ Seeking industry partner for further codevelopment

and materials. The technology is well suited for all applications of polyimide and other high-performance polymer-jacketed wire constructions.

Technology Details

Major limitations of current aerospace wire insulation are that it tends to crack and fray as it ages and is easily damaged. Generally, it is more cost-effective to repair wire insulation than to replace a section or the whole wire (or bundle) itself. Current repair methods include a tape wrap repair and a heat shrink repair. These methods have a number of drawbacks: susceptibility to vibration, fluid intrusion, and other mechanical stresses. The repair patch/material can loosen or seperate, exposing the bare metal conductor or opening the polyimide insulation to more damage at the interface.

The manual repair technology developed by NASA is a flexible polyimide film patch (either wrap or sleeve application) that is heated with a custom heating tool to melt, flow, and cure the film. The new technology results in hermetically sealed, permanent repairs that are much more flexible and less intrusive than repairs made using current practices. The repair remains flexible after application, has no limit in length or bend radius, and retains the high-temperature exposure of the original polyimide insulation. Extensive testing by NASA and NAVAIR has demonstrated that these repairs comply with industry standards for tensile strength, electrical resistivity, voltage breakdown, solvent resistance, and flammability. This repair technique is adaptable and may also be used on larger-gauge wiring, as well as flat-ribbon wire harnesses and twisted shielded wires.

Partnership Opportunities

All NASA licenses are individually negotiated with the prospective licensee, and each license contains terms concerning commercialization (practical application), license duration, royalites, and periodic reporting. NASA patent licenses may be exclusive, partially exclusive, or nonexclusive. If your company is interested in the Polyimide Wire Insulation Repair System technology, or if you desire additional information, please reference Case Number KSC-12871 and contact:

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